

## **REMARKS**

Applicants have now had an opportunity to carefully consider the Examiner's comments set forth in the Office Action of February 23, 2004.

All of the Examiner's objections and rejections are traversed.

Reexamination and reconsideration are respectfully requested.

### **The Office Action**

**Claims 1-6, 8, 9, 11-17, 19-26, and 29** remain in this application.

**Claims 17 and 24** stand rejected under 35 U.S.C. §112, second paragraph.

**Claims 1-6, 8, 11, 16, and 29** stand rejected under 35 U.S.C. §102(e) as being anticipated by Worley (US Patent No. 6,393,183).

**Claims 17, 19, 20, and 22** stand rejected under 35 U.S.C. §102(e) as being anticipated by Chin (US Patent No. 6,343,223).

**Claims 14 and 15** stand rejected under section 103(a) as being unpatentable over Worley (US Patent No. 6,393,183) in view of Sekiguchi et al. (U.S. Patent 6,084,650).

**Claims 21 and 25** stand rejected under section 103(a) as being unpatentable over Chin (US Patent No. 6,343,223) in view of Hammond et al. (U.S. Patent 5,859,658).

**Claims 23 and 24** stand rejected under section 103(a) as being unpatentable over Chin (US Patent No. 6,343,223) in view of Rajeswaran et al. (U.S. Patent 5,917,534).

**Claim 26** stands rejected under section 103(a) as being unpatentable over Chin (US Patent No. 6,343,223) in view of Yamasaki et al. (U.S. Patent 4,812,415).

**Claims 9, 12, and 13** were objected to as being dependent upon rejected base claim. It was indicated in the Office Action that **claims 9, 12, and 13** contain an allowable subject matter.

### **Claims 9, 12, and 13 are Allowable**

**Claim 9** has been written in an independent form to include all the limitations of claim 1. It is therefore respectfully submitted that **claim 9 and dependent claims 12-13** are allowable.

### The Interview with the Examiner

On April 20, 2004, Applicants held a brief telephone interview with the Examiner and with the Primary Examiner. Applicants gratefully acknowledge the opportunity to discuss the application and cited references.

At the interview, the Applicants discussed with the Examiners that the bond wire of Worley is not a spring interconnect. It is the Applicants understanding that as a result of the interview, the finality of the Office Action is withdrawn.

### Non-Art Rejections

Rejection of **claim 17** under 35 U.S.C. §112, second paragraph, have been alleviated by the appropriate amendments. It is respectfully requested this ground of rejection of claim 17 be withdrawn.

Rejection of **claim 24** under 35 U.S.C. §112, second paragraph, have been alleviated by the appropriate amendments. It is respectfully requested this ground of rejection of claim 24 be withdrawn.

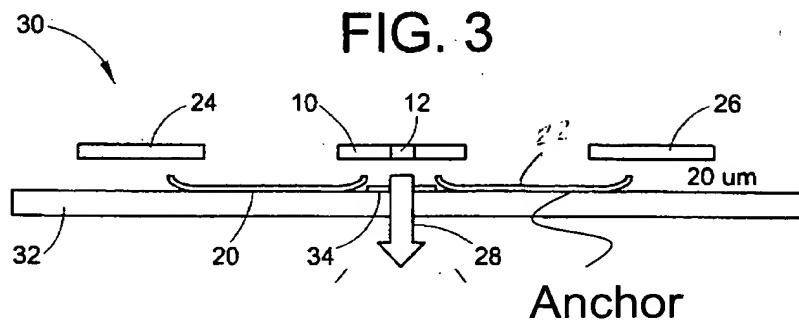
### The Art Rejections

#### Claims 1, 2-6, 8, 11, and 16 Distinguish over References

**Claim 1** calls for among other limitations: a spring interconnect formed on the substrate, the spring interconnect including: an elastic material that is operatively associated with a surface of the substrate including: an anchor portion fixed to the substrate, and a free portion spaced from the substrate, the free portion including a tip separated from the substrate; said spring interconnect and said sensor being integrated on the substrate.

**Worley** is directed to optically linking two silicon chips together. Fig. 6B shows an example of a bond wire 604 going from a pad on chip 606 to a lead 602 of the top lead frame. (See col.12, lines 18-19). It is asserted in the Office Action that bond wire 604 is a spring interconnect which includes an anchor portion, fixed to the substrate, and a free portion, spaced from the substrate which free portion includes a tip. Initially, Applicants submit that a bond wire is not a spring interconnect. Next, the bond wire 604 is not formed on the substrate, but, rather, its tip is bonded to the substrate, e.g. soldered or otherwise electrically connected to the substrate. To the contrary, claim 1 calls for the spring interconnect that is formed on the substrate.

(Please see Fig. 3 showing a substantial portion of the interconnect, "anchor", which is fixed to the substrate.)



Moreover, the interconnect and the sensor of claim 1 are integrated on the substrate. "Integrate" means to be incorporated into a larger unit (such as substrate) or, at minimum, to be disposed on the substrate. (Webster, 11<sup>th</sup> Ed.) Only the tip of Worley's interconnect is bonded to the substrate 606. Worley's interconnect is not integrated with the substrate, nor it is disposed on the substrate as claimed in claim 1.

Additionally, in accordance with the Applicants invention, the anchor is connected to the substrate and the tip of the free portion is connected to the separate chip, e.g. the LED source. As interpreted in the Office Action, Worley's interconnect has a tip connected to lead 602 and not to another silicon chip. For the reasons stated, it is respectfully submitted that **claim 1 and dependent claims 2-6, 8, 11, and 16** distinguish patentably and unobviously over Worley.

**Claim 8** calls for among other limitations: at least one of the materials for the spring interconnect and the sensor to be the same. It was alleged in the Office Action that Worley makes such a teaching in Col. 8, line 1- Col. 10, line 2. Nowhere Worley does disclose or suggest using at least one same material for the bond wire 604 and the sensor. It is therefore respectfully submitted that **claim 8** distinguishes patentably and unobviously over Worley.

In the case the Examiner maintains this ground for rejection of claim 8, Applicants respectfully request the Examiner provide a more specific reference where Worley teaches that the sensor comprises of at least one material common to

the bond wire such that this material can be formed/deposited during sensor fabrication to fabricate a claimed spring interconnect.

**Claim 11** calls for among other limitations: elastic material that is a stressed metal layer having sub-layers of differing stresses. It was alleged in the Office Action that Worley makes such a teaching in Col. 8, line 1- Col. 10, line 2. Nowhere does Worley disclose or suggest using an elastic material of different stresses for the bond wire 604. It is therefore respectfully submitted that **claim 11** distinguishes patentably and unobviously over Worley.

In the case the Examiner maintains this ground for rejection of claim 11, Applicants respectfully request the Examiner provide a more specific reference where Worley teaches that the bond wire comprises different metal of different stresses.

#### **Claims 17 and 19-21 Distinguish over References**

**Claim 17** calls for among other limitations: a spring interconnect formed on the substrate from an elastic material and a sensor formed on the substrate in an integrated manner with the spring interconnect. **Chin** is directed to an apparatus for improving blood perfusion by providing light sources and a detector. The Examiner asserts that a bent piece of metal 160 is a spring interconnect formed on a pad (substrate) 162. Chin's bent metal is not a spring interconnect. Nor it is formed on the substrate from an elastic material. The sensor and the bent metal are clearly not integrated on the substrate. To be exact, the sensor and the substrate are integrated on the bent metal. Nowhere does Chin disclose or suggest a spring interconnect formed on the substrate from an elastic material such that its elongated portion is fixed to the substrate and its free portion is bent up and away from the substrate. It is therefore respectfully submitted that **claim 17 and dependent claims 19-21** distinguish patentably and unobviously over Chin.

#### **Claims 22-25 Distinguish over References**

**Claim 22** calls for among other limitations: a calibration/printing system comprising a sensor element integrated on a substrate with a plurality of spring interconnects. **Chin** is directed to an apparatus for improving blood perfusion by providing light sources and a detector. Initially, Applicants respectfully submit that Chin is not directed to a calibration/printing system, and, as such is not an

applicable prior art. The piece of metal 160 includes a plurality of traces, which Examiner interprets as being “a plurality of interconnects.” Traces on the metal piece are not spring interconnects. Since Chin does not disclose or suggest spring interconnects, a communication path is not formed between the light source and the driver chip by first and second spring interconnects as recited in claim 22. Chin further teaches the pad 162 containing a light source 166, and the pad 164 containing a sensor 168. (Col. 8, lines 3-19). A light source 166 is not aligned with the sensor 168 such that the light is directly sensed by the sensor (see figs. 5c-5g) as recited in claim 22. The sensor of Worley includes a memory chip 12 which is used to store thermal coefficients. (Fig. 2 and col. 5, lines 43-45). In FIGURE 2, Chin shows the components of the system which are schematically depicted as square boxes on top of each other. The chip 12 is not *physically* aligned with the sensor as claimed in claim 22. Nowhere does Chin disclose or suggest a plurality of spring interconnects aligned to provide a communication path between the light source and driver chip such that the light is directly sensed by the sensor. It is therefore respectfully submitted that **claim 22 and dependent claims 23-25** distinguish patentably and unobviously over Chin.

**Claim 26 Distinguishes over References**

**Claim 26** calls for among other limitations: a spring interconnect structure disposed on a substrate. **Chin** is directed to an apparatus for improving blood perfusion by providing light sources and a detector. The light sources might be lasers. Initially, Applicants respectfully traverse Examiner’s interpretation of a bent metal 160 as a spring interconnect. Moreover, the metal 160 is not formed on a substrate 162.

Next, the Applicants submit that the present application was distinguished patentably over Yamasaki in Amendment AA. However, it appears that the Examiner did not consider Applicants arguments. Applicants here are making a good faith effort to distinguish Yamasaki yet again. **Yamasaki’s** sensor has an active layer (3) which serves as the absorption layer for blocking ultraviolet light used in the sensor’s fabrication process. (Col. 3, lines 44-45). The layer (3) is located between first and second conductive/transparent layers (2, 23). Yamasaki does not disclose or suggest utilizing a separate absorption layer disposed between the second transparent/conductive and the passivation/release layer to block

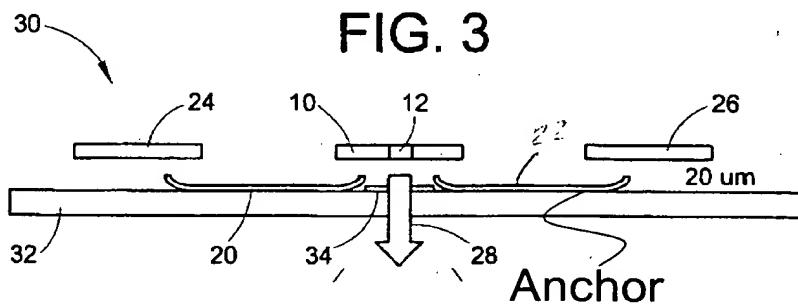
unwanted visible light as recited in claim 26. None of Chin and Yamasaki, taken singularly or in combination, discloses or suggests a spring interconnect and a sensor, both formed on a substrate, wherein the sensor includes an absorption layer which is disposed between the second transparent/conductive and the passivation/release layer to prevent some of the visible light from reaching the active layer. It is therefore respectfully submitted that **claim 26** distinguishes patentably and unobviously over Chin and Yamasaki.

#### Claim 29 Distinguishes over References

**Claim 29** calls for among other limitations: a spring interconnect formed on the substrate from an elastic material including an anchor portion fixed to the substrate, and a bent up free portion which makes an electrical contact with one of the first and second devices; the spring interconnect and the sensor being integrated on the substrate.

**Worley** is directed to optically linking two silicon chips together. Fig. 6B shows an example of a bond wire 604 going from a pad on chip 606 to a lead 602 of the top lead frame. (See col.12, lines 18-19). It is asserted in the Office Action that bond wire 604 is a spring interconnect which includes an anchor portion, fixed to the substrate, and a free portion, spaced from the substrate which free portion includes a tip.

Initially, Applicants submit that a bond wire is not a spring interconnect. Next, the bond wire 604 is not formed on the substrate, but, to rather, its tip is bonded to the substrate, e.g. soldered or otherwise electrically connected to the substrate. To the contrary, claim 29 calls for the spring interconnect that is "formed" on the substrate. (Please see Fig. 3 showing a substantial portion of the interconnect, "anchor", which is fixed to the substrate.)



Moreover, the interconnect and the sensor of claim 29 are integrated on the substrate. "Integrate" means to be incorporated into larger unit (substrate) or, at minimum, to be disposed on the substrate. (Webster, 11<sup>th</sup> Ed.). Only the tip of Worley's interconnect is bonded to the substrate 606. Worley bond wire is not a thin film, nor it is manufactured in an integrated fashion with the silicon chip.

Additionally, in accordance with the Applicants invention, the anchor is connected to the substrate and the tip of the free portion is connected to the separate chip, e.g. the LED source. Worley interconnect has an anchor connected to the substrate and the tip connected to lead 602 and not to another chip. For the reasons stated, it is respectfully submitted that **claim 29** distinguishes patentably and unobviously over Worley.



### CONCLUSION

For the reasons detailed above, it is respectfully submitted all claims remaining in the application (**Claims 1-6, 8, 9, 11-17, 19-26, and 29**) are now in condition for allowance. The foregoing comments do not require unnecessary additional search or examination.

No additional fee is believed to be required for this Amendment BB. However, the undersigned attorney of record hereby authorizes the charging of any necessary fees, other than the issue fee, to Xerox Deposit Account No. 24-0037.

In the event the Examiner considers personal contact advantageous to the disposition of this case, he/she is hereby authorized to call Marina Zalevsky, at Telephone Number (216) 861-5582.

Respectfully submitted,

FAY, SHARPE, FAGAN,  
MINNICH & McKEE, LLP

April 23, 2004  
Date

  
\_\_\_\_\_  
Marina V. Zalevsky  
Reg. No. 53,825  
1100 Superior Avenue, 7<sup>th</sup> Floor  
Cleveland, Ohio 44114-2579  
(216) 861-5582

N:\XERZ\200292\1A\MVZ0000192V001.DOC